8 EPPING PTY LTD

WATER SENSITIVE URBAN DESIGN REPORT
PROPOSED RESIDENTIAL DEVELOPMENT
6-8 EPPING ROAD, EPPING

Revision 1
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HENRY & HYMAS
LEVEL 5, 79 VICTORIA AVENUE
CHATSWOOD NSW 2067
Our Ref: 14486
Tel: (02) 9417 8400 Fax: (02) 9417 8337
E-mail: email@hhconsult.com.au

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1 INTRODUCTION

1.1 General

This Water Sensitive Urban Design (WSUD) Report has been prepared to supplement the proposed Development Application (DA) to Hornsby Shire Council for proposed Residential Development located at 6-8 Epping Road, Epping. The development will consist of eleven storey building with nine residential levels and two basement parking levels.

The following Engineering matter has been addressed in this report:

- Stormwater Management including water quantity and Water Sensitive Urban Design (WSUD);

The purpose of this report is to provide an overview of the various Engineering issues that relate to the site and how these issues have been addressed.

A full set of DA Drawings is provided in Appendix A of this report which detail the various Engineering issues listed above.

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2 STORMWATER MANAGEMENT

2.1 Introduction

2.1.1 Background

Stormwater controls will be implemented that ensure that the proposed development does not adversely impact on stormwater flows and water quality of the stormwater system downstream of the site.

The principles and operation of the proposed stormwater system for the development including water quality treatment measures, on-site stormwater detention (OSD) and inter-allotment drainage system are detailed on the Development Application Drawings included in Appendix A.

2.1.2 Key Issues

The key issues and the proposed mitigation measures to be implemented as part of the proposed development are:

- **Stormwater Quantity** - The increased impervious surfaces (such as roads, roofs, driveways, etc) associated with the development will result in an increase in peak stormwater flows from the site during storm events. On-site Stormwater Detention (OSD) is proposed for the development to ensure that runoff from the development is appropriately managed in accordance with Council's requirements. The site stormwater system has been designed to safely convey the flows through the site and within the capacity of the downstream system. The design and operation of the proposed stormwater system is described in Section 2.2 below.

- **Water Quality** - Urban developments have the potential to increase gross pollutants, sediments, hydrocarbons and nutrient concentrations in stormwater runoff. To limit impact on the downstream water quality, water quality treatment measures at source and end of line treatments will be provided. Section 2.3 further describes the specific implementation of these measures for the proposed development.

2.2 Stormwater Quantity

2.2.1 Catchment Description

The existing catchment is predominantly urban in character and has a terrain slope of approximately 10%. However, upon development of the land, the catchment will be transformed into an area having a much higher impervious ratio and flatter grades than in its existing state.

The site currently drains freely toward the back of the site in the vicinity of Forest Park. In addition, the site lies within the Terrys Creek Catchment. Various stormwater treatments are proposed that will ensure there is no adverse impacts on this creek system as a result of the proposed development. These are described in further detail below.

The developed catchment will comprise of a mixture of impervious and pervious areas. The majority of the runoff from the developed site is impervious and consists of footpaths, roof areas and other paved areas. The pervious component of the developed catchment consists of vegetated landscaping and grassed areas.

2.2.2 Existing Drainage System

The site at 6-8 Epping Road, Epping currently drains toward the back in the vicinity of the Forest Park which forms part of the wider Terrys Creek catchment. It is not known where the two sites discharge stormwater and there are no stormwater easements identified on the titles of these or adjacent properties. Given the age of the lots, it is possible that stormwater discharges to the rear without a formal easement.

2.2.3 Proposed Drainage System

The drainage system for the proposed residential development has been designed to collect all concentrated flows from the future building impervious surfaces such as driveways, footpaths and roof areas. The piped drainage and OSD system has been designed generally to convey the 1 in 20 year ARI with adequate provision for higher infrequent storm events to be safely conveyed overland.

The stormwater network has been designed to safely convey minor storm events via a pit and proposed easement through adjacent properties. Proposed inter-allotment drainage has been designed to ensure the stormwater can be discharged to the existing stormwater system in the Forest Park.

Proposed Stormwater 360 StormFilter with cartidges will be used for water quality purposes (Refer Section 2.3 below) as well as On-site Stormwater Detention (OSD) to ensure that runoff from the development is appropriately managed. OSD will be provided to ensure that the 20 year ARI post developed flow does not exceed the 5 year ARI pre-developed flows in accordance with council's requirement.

The peak flows from the site are summarised in Table 1 below.

5 year ARI Pre-developed Flow	20 year ARI Post Developed Flow	Discharge Point
79 L/s	75 L/s	Existing Council Stormwater Drainage system via proposed easement through proposed inter-allotment drainage system

Table 1: Peak Flows

2.3 Water Quality

2.3.1 Water Quality Requirements

As previously stated, urban developments have the potential to increase gross pollutants, sediments, hydrocarbons and nutrient concentrations in stormwater runoff. To limit impact on the downstream water quality, water quality measures at source and end of line treatments will be provided. This section describes the specific implementation of these measures for the proposed development.

MUSIC modelling was conducted to ensure that the water quality treatment targets nominated by Council will be achieved. Refer Table 2 below for details of target pollutant removal rates and the rates that will be achieved by implementation of the water quality treatment measures proposed for the site.

STORMWATER 360- FILTER	Sources	Residual Load	Reduction %	Target Reduction %
Total Suspended Solids (kg/yr)	39.1	6.43	83.3	80
Total Phosphorus (kg/yr)	0.254	0.293	60.5	60
Total Nitrogen (kg/yr)	3.26	4.41	45	45
Gross Pollutants (kg/yr)	37.7	0	100	90

Table 2: Stormwater 360- StormFilter

The following water quality treatment measures have been designed for the proposed development.

2.3.2 STORMWATER 360- STORMFILTER

The Stormwater 360 StormFilter cartridge system proposed for the development has been designed with 13 cartridges to achieve the removal rate of nutrients. The filter will be located within the OSD system.

2.3.3 Pit Baskets

In addition to the proposed Stormwater 360 StormFilter, it is proposed to provide pit baskets such as Enviopods or an approved equivalent for all grated gully pits within the development These pit baskets will assist in the water quality treatment for the site by capturing a large portion or gross pollutants, large sediment particles and organic matter that may also contain nutrients.

3 CONCLUSION

Appropriate stormwater management practices will be implemented that minimise the impact of development on the existing stormwater system in terms of water quality whilst ensuring safe and efficient conveyance of runoff and the provision of adequate freeboard to habitable dwellings.

Whilst it is inevitable that development will have an impact of the existing landform and stormwater runoff characteristics due to earthworks, change of land-use and changes in impervious areas; by providing a safe and efficient design, and implementing appropriate measures during construction and operation of the development, it can be ensured that there will be minimal impact on the existing environment as a result of the proposed development.

It should be noted that the results shown in this report are limited to use for Development Application purposes only. During the detailed design stages, a further refinement of the modelling based on the detail design of the development will be necessary.

4 References

- Hornsby Shire Council – Design Specification D5- Stormwater Drainage Design
- Hornsby Shire Council – Civil works Specification Design Series 2005
- NSW DEC Managing Urban Stormwater : Council Handbook
- Landcom - "Soils and Construction Volume 1 – 4th Edition", March 2004
- Institution of Engineers, Australia - "Australian Rainfall and Runoff 3rd Edition", 1987

APPENDIX A

DEVELOPMENT APPLICATION DRAWINGS